

Docking Log / Dual Axis Speed Log

SAL T2



System Description

The SAL T2 measures longitudinal relative speed through water as well as two-axis true speed over ground. In combination with an external Rate of Turn Gyro a full docking log functionality is achieved.

Electronics Unit – ELC

The ELC controls the measurements. It contains two independent units, one for speed through water measurement and one for speed over ground measurement. Both measuring functions are based on the acoustic correlation principle. The basic concept is the measurement of the time delay between the characteristics of reflected sonic pattern sensed by the receivers. Echo signal modulation is used for speed estimation. The speed is estimated from the fix distance between sensor elements divided by the estimated time delay from correlation, where two signals are compared by shifting one relative to the other in time, and choosing the time shift where the maximum similarity is found.

The speed data calculated in the ELC is sent as serial IEC61162-1 / NMEA messages for further processing in the LPU or directly to any other user.

Transducer – TRU

The combined transducer is mounted in a sea valve arrangement suitable both for single and double bot-

tom designs. The transducer incorporates as standard a 30 metres cable for connection to the ELC. This one combined transducer that is equipped with separate crystals for relative water speed and true speed over ground. The crystals work both as transmitters and receivers.

Log Processing Unit – LPU

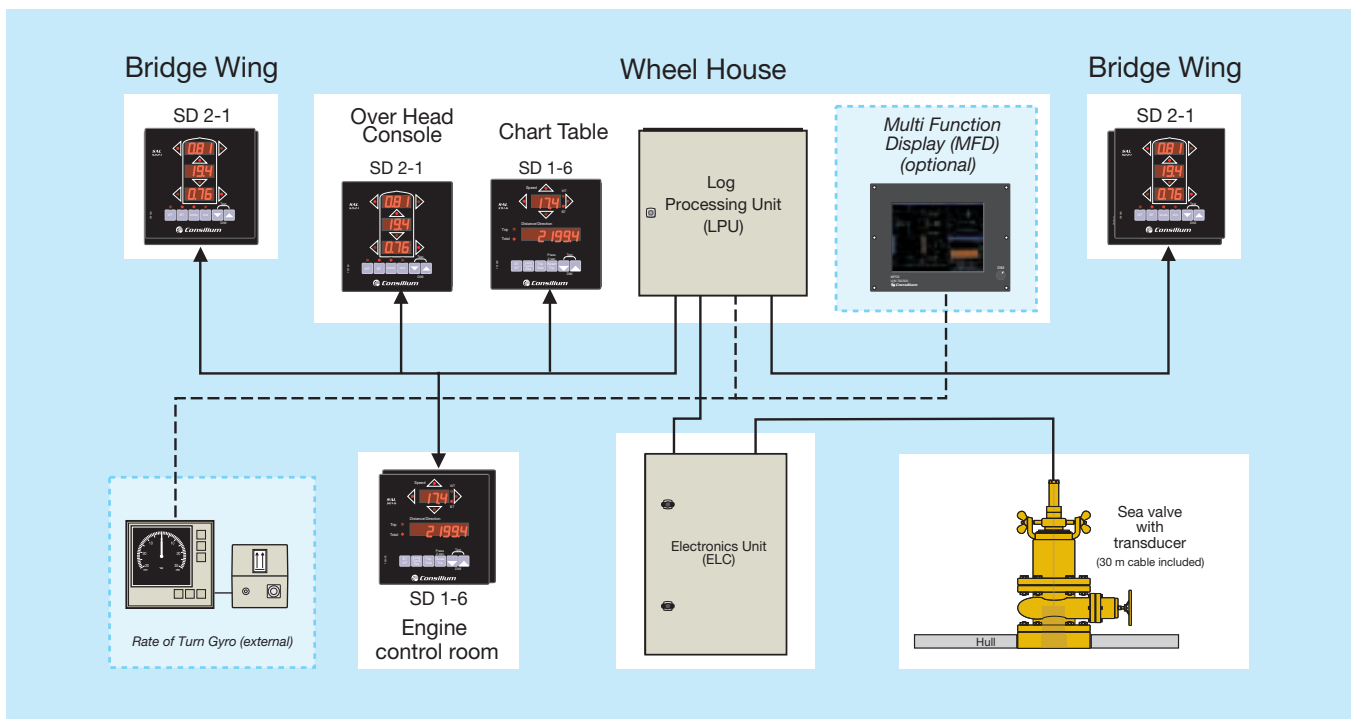
The LPU is mounted on the wheelhouse area and receives the NMEA message from the ELC. The LPU has various options to perform message conversion and calculations and has also variety of inputs for receiving data from other units e.g. Rate of Turn Gyro for docking functionality. Various outputs are available for external users, such as autopilot, radar, AIS, VDR, fin stabilizers etc.

Serial Digital Indicators – SD1/SD2

The SD1/SD2 series of indicators gives a flexible solution to the presentation of longitudinal and transverse speeds and distance measurement.

Multi Function Display – MFD (option)

The MFD shows all information of the Docking Log System both in accurate digital read-outs and easy-to-read analogue bar graphs.



Typical docking log configuration

Technical Specification – SAL T2

- Extension board SDE (for SD2)
- Gimbal mounting box

Water track Speed

Speed range	±55 knots sensed water speed
Speed inaccuracy	0,1 knot or 0,5%, whichever is greater
Distance inaccuracy	<±0.5% of travelled distance in water
Minimum water depth	3 metres below transducer

Bottom track Speed

Speed range	±40 knots in any direction	
Depth range	2 – 250 metres below transducer	
Speed inaccuracy	0.1 knot or 0.5%, whichever is greater	
Distance Inaccuracy	Travelled Distance	Inaccuracy
	2 - 10 NM	±0.2%
	10 - 50 NM	±0.1%
	> 50 NM	±0.05%

Electronics Unit – ELC

(Acc. Speed Log requirements, IEC61023)

Environmental conditions	IEC 60945
System voltage	230 V AC -15% / +10%
	115 V AC -15% / +10% Option
Frequency	46 - 66 Hz
Power consumption	< 300 VA
Serial outputs	IEC 61162-1*
	\$VDVBW, \$VDDPT & \$VDVLW
Dimensions (WxHxD)	360x480x240 mm
Weight	18 kg
Colour	RAL 7032

Transducer – TRU

Acoustic elements	Water tracking 2 elements, 4 MHz frequency
	Bottom tracking 5 elements, 150 kHz frequency
Cable length	30 m. standard (40 m. option)
Dimensions	144 mm height, Ø 122 mm
Weight	23 kg (incl. 30 m. cable)

Indicators – SD1 / SD2

Environmental conditions	IEC 60945
Power input	10-30 V DC approx 300 mA
Data input	IEC 61162-1*
Connections	10 pole (SD1) / 14 pole (SD2)
Read-outs	SD1: 3 digit + 6 digit + 8 LED
	SD2: 3 digit + 3 digit + 3 digit + 8 LED
Memory	Non-volatile memory for configuration and distance counter
Front panel	Waterproof foil
Dimensions (WxHxD)	144x144x33 mm
Weight	0.6 kg
Colour	NCS-9000-N (panel), NCS-6507-N (text)
Accessories:	- Sealing frame kit for outdoor mount
	- 48/115/230 AC power supply SDP
	- Bulkhead mounting box BMB
	- Remote control SDR (for SD1)

Log Processing Unit – LPU

Environmental conditions	IEC 60945
System Voltage	230 V AC -15% / +10%
	115 V AC -15% / +10% Option
Frequency	46 - 66 Hz
Power consumption	max 300 VA
Serial outputs	IEC 61162-1*
	\$VDVBW, \$VDDPT & \$VDVLW
Dimensions (WxHxD)	500x500x200 mm
Weight	20 kg
Colour	RAL 7032
Inputs	
Speed input from ELC	IEC 61162-1*
Rate of Turn input	IEC 61162-1* or Analogue ±10 V DC
Auxiliary inputs	2 serial IEC 61162-1* or RS232 interfaces and 3 analogue inputs

Outputs

Relay, opto and analogue outputs configurable to carry water track or bottom track speeds as required, including transverse, resulting or longitudinal components

- Separately buffered IEC 61162-1* 7 pcs
- Each unit can be loaded with more than one user
- Switch-over contact relays 4 pcs
- Closing-contact relays 12 pcs
- Opto-couplers 8 pcs
- RS232 output for MFD 1 pc
- Analogue 0.1 VDC/knot 2 pcs

Aux serial outputs with IEC 61162-1* and RS232 drivers. 24 V DC and AC outputs for MFD, Rate of Turn Gyro etc.

Multi Function Display – MFD (option)

10.4" SVGA monitor integrated with PC computer in IP65 cabinet

Environmental conditions	IEC 60945
Data input	RS 232 (COM1)
Power input	24 V DC
Dimensions (WxHxD)	325x250x100
Weight	3 kg

Docking log system performance (option)

In addition to data from log and Rate of Turn Gyro, the Docking Log System will display the transversal bottom track speed for both ends of the ship with an accuracy of 0.1 knots provided the Rate of Turn Gyro zero drift is less than 0.3%/min.

Sea valve – MSSBSV (Standard, single bottom)

Dimensions (WxHxD)	Ø250x734x515 mm
Weight	75 kg

Sea valve – MSDBSV (Optional, double bottom)

Dimensions and weight depending on tank height.

* IEC 61162-1, 2nd Edition, closely aligned with NMEA 0183 ver 2.30



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